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THE LARVA OF *CHRYSOLINA FRAGARIAE* (WOLLASTON 1854)

By DIETER ERBER* and LEV M. MEDVEDEV**

With 1 figure

SUMMARY: The larva of *Chrysolina fragariae* is described. The features are compared with those of other *Chrysolina larvae*. The differences between larval and imaginal systematic are discussed.

SUMÁRIO: Os autores descrevem a larva de *Chrysolina fragariae* e fazem uma comparação das suas características com outras larvas de *Chrysolina*.

INTRODUCTION

Chrysolina fragariae (WOLL.) is an endemic species for Madeira, which furthermore is extremly confined and strongly adapted to a certain area of the main island (steep slopes with northern exposure between 800 to 1000 m) and to an endemic *labiatae* brush (*Bystropogon maderense* WEBB.) it feeds on. (ERBER 1984).

Such ecologically highly specialised forms could possibly provide data for the clarification of evolutionary and systemtic problems within closely related groups. However, sufficient specimens must be at hand for such investigations.

After the rediscovery of *Chrysolina fragariae* in 1983 (ERBER 1984) a large number of imagos were collected. Those were investigated karyotypically by PETITPIERRE (1988). *Larvae*, on the other hand, until now were obtained in small number only, fortunately, however, in various stages of development (see ERBER 1984). Thus the third larval stage could be described by MEDVEDEV and will be presented in the following.

*Justus-Liebig-Universität Giessen, Institut für Biologiedidaktik, Karl Glöckner-Str.21 C, 6300 GIESSEN, Germany

**Institute for Evolutionary, Animal Morphology and Ecology, Leninsky prosp.33, MOSCOW V-71, GUS

DESCRIPTION OF THE LARVA (THIRD INSTAR)

Body white with very small light bristles, which are seen only under high magnification, head dark brown, prothorax and legs flavous. Length of body about 7mm, breadth of head capsule 2,3mm.

Head (fig.1,A) slightly transverse, vertex with dense sclerotization of small ovate grains and with short. sparse *setae*. Epicranial suture long, frontal sutures thin, parallel in basal part, then diverging in an obtuse angle, straight and disappearing before antennal bases. Frons broad, feebly grooved in the middle, with large reticulate microsculpture, 14 primary setae, and 20-22 secondary short *setae*. Labrum (fig.1,B) transverse, in basal part sclerotized and feebly convex, basal angles acute, apical angles broadly rounded, fore margin truncate with deep trapeziform incisure and 4 thick marginal *setae* on each side; surface with 8 pores, 4 long discal *setae* in a transverse row and 2 *setae* just before margin. *Antennae* 3-segmented (fig.1,C), segment 2 with 3 setae and conical sensilla at apex. Mandibles (fig.1,D) short, light flavous, 5-toothed, with a pore and 2 long *setae* on outer margin. Maxillar *palpi* 4-segmented, labial *palpi* 2-segmented.

Thorax and abdomen: Prothorax (fig.1,Ea) with transverse sclerite, divided in the middle with a light stripe, surface with sparse sclerotized grains and very short *setae*, not arranged in rows. Meso and metathorax with very feeble transverse fold in the middle and very small, almost indistinct *setae*, wing sclerites distinct, ovate and convex, more or less rugulose, with 3 or 4 *setae* and numerous pores (fig.1,Eb). Tergites 1-6 practically all of same structure, but epipleural sclerites small, feebly convex and not very distinct, each with 2 small *setae* (fig.1,Ec); tergites 7-9 with unpaired, feebly coloured central sclerites, covered with rather long and numerous *setae* (fig.1,F). Sternites of thorax (fig.1,G) and venter (fig.1,H) with distinct, but feebly coloured sclerites, bearing rather thick and long setae.

Upperside with polygonate microsculpture, wich forms 3 more or less dark longitudinal stripes, narrow in the middle and two more broad on sides. Underside with thorn-like microsculpture. *Stigmae* with narrow scerotized ring.

Tibiotarsus short, claw with a large quadrangular tooth at base and strongly curved beneath apical part (fig.1,J).

This species must be placed near *C.sturmi* (WESTH.)(=*diversipes* (BED.)), *C.cerealis* (L.), *C.haemochlora* (GEBL.) *C.angusticollis* MOTSCH., but especially near *C.virgata* MOTSCH. (subgenus *Euchrysolina* BECH.), from which it differs with short secondary *setae* on the head. In general this species and subgenus are characterized with dark head and light coloured body, short secondary *setae* of head, absence of sclerites and strongly reduced *setae* on upperside and large basal tooth of claws.

DISCUSSION

If one compares this find with the systematics of the genus *Chrysolina* MOTSCH. according to the characters of the imagos, one notes conspiquous descrepancies:

BECHYNÉ (1950) assignes the above named species for the most part to distinct and widely separate subgenera:

C.haemochlora	--	sg. *Timarchoptera* MOTSCH.(near 4 Timarchomima BECH.)
C.virgata	--	sg. 9 *Euchrysolina* BECH.
C.fragariae	--	
(C.staphylea)	--	
(C.banksi)	--	sg.14 *Chrysolina* MOTSCH.s.str.
(C.obsoleta)	--	
(C.rutilans)	--	
C.cerealis	--	sg.15 *Chrysomorpha* MOTSCH.
C.diversipes	--	sg.23 *Colaphosoma* MOTSCH.
C.angusticollis	--	sg.29 *Caudatochrysa* BECH.

So a close relationship is found solely between C.fragariae and C.cerealis.

Similarly in the phyllogenetically aligned (orientated) study of BOURDONNÉ & DOGUET (1991) the named species - so far as they are included - are assigned to different but distently related subgenera within the group of Lamiaceae feeding species:

C.virgata	--	sg. 4 *Euchrysolina* BECH.
C.cerealis	--	sg. 7 *Chrysomorpha* MOTSCH.
C.diversipes	--	sg.13 *Colaphosoma* MOTSCH.
(C.staphylea)	--	
(C.banksi)	--	sg.15 *Chrysolina* MOTSCH.s.str.
(C.obsoleta)	--	
(C.rutilans)	--	
C.fragariae	--	sg.16 *Rhyssoloma* WOLL.

In both systems, in contrast, the degree of relationship of *C.fragariae* with *C.stapylea* (L.), *C.bankii* (F.)(=*banksi* (F.)), *C.obsoleta* (BRULLÉ) and *C.rutilans* (WOLL.) is notable. This arrangement is very well supported by chromosomal evidence of PETITPIERRE (1988:157): "Although *C.fragariae* differs from its more closely related species, *C.banksi*, *C.obsoleta*, *C.rutilans* and *C.staphylea* (all included in the subgenus *Chrysolina s.str.*), by keeping the Xyp sex-chromosome system instead of the derived XO system found in the other species. This fact points to the ancestral nature of *C.fragariae*, which is a possible relic species now confined to the island of Madeira."

An agreement in the systematics of larvae and imagos referring at least *Chrysolina fragariae* and its relations is not the case here. The larval features, although they have provided assistance in the judging of the systematic positions of the subfamilies of the Chrysomelides (STEINHAUSEN 1985), have not provided such possibilities until now for the naturally more difficult classification of the species within the genus *Chrysolina*. The reasons for this, on the one hand, may lie in the fact that relatively few larvae of this genus are known, on the other hand, in that a large degree of obscurity still exists on the phylogenetic weight of the individual characters used. Furthermore also the systematic of the imagos can not be regarded as concluded.

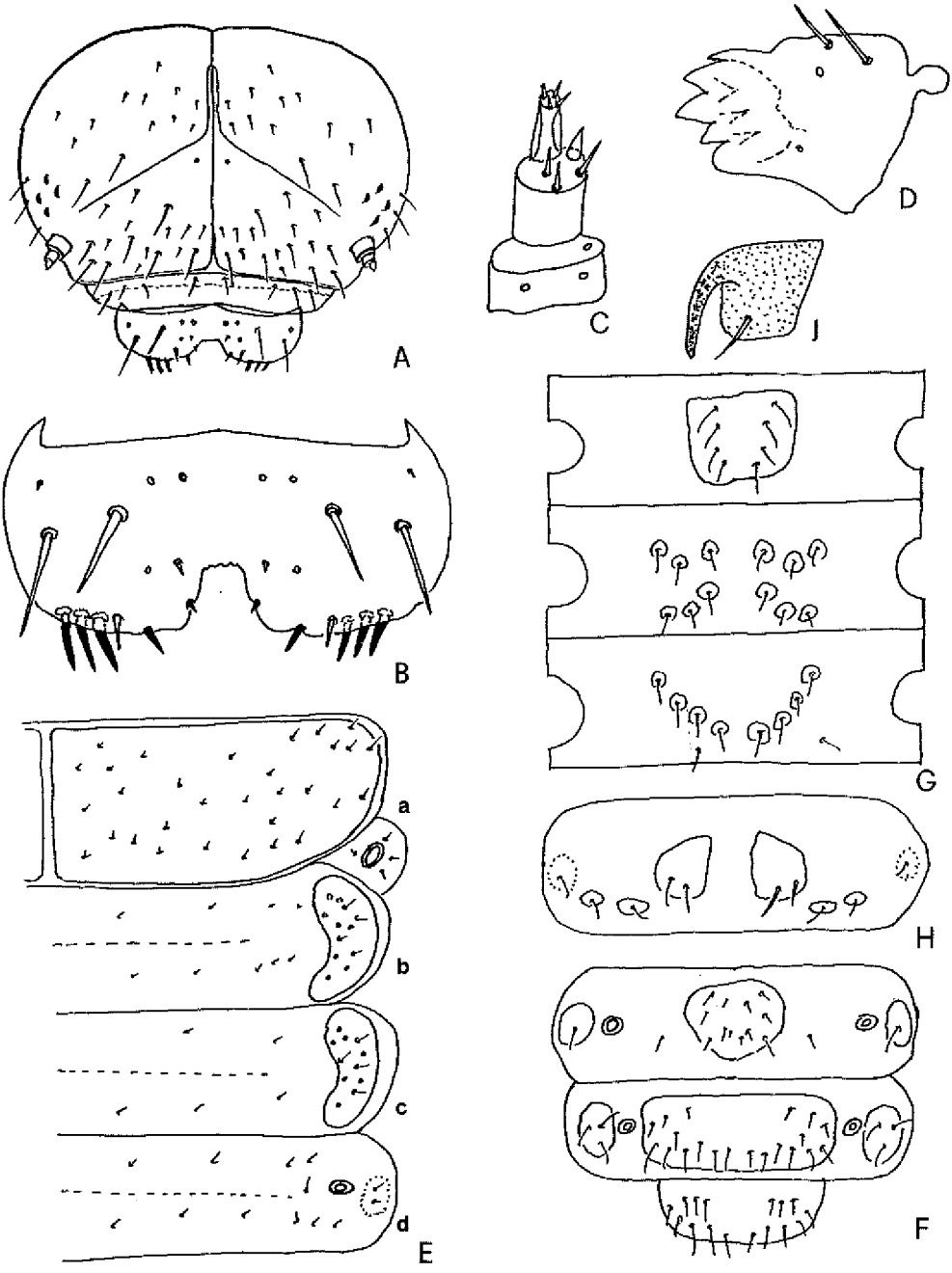

Fig.1: Larva of *Chrysolina fragaria* WOLL., third instar. A = head; B = labrum; C = antenna; D = mandible; E = tergites of prothorax (a), mesothorax (b); metathorax (c) and first abdominal segment (d); F = abdominal tergites VII-IX; G = sternites of thorax; H = first abdominal sternit; J = claw.

REFERENCES

BECHYNÉ,J.:

1950. 7.Contribution à la Connaissance du Genre Chrysolina Motsch. (Col.Phytophaga Chrysomelidae). *Entomol.Arb.Mus.G.Frey* **1**:47-185.München.

BOURDONNÉ,J.-C. & DOGUET,S.:

1991.Donnée sur la Biosystematique des Chrysolina l.s(Coleoptera:Chrysomelidae:Chrysomelinae). *Annls Soc.ent.Fr.*(N.S.) **27**(1):29-64.

ERBER,D.:

1984. Wiederfund von Chrysomela fragariae Woll.1854 auf Madeira. *Bocagiana* No.73:1-9.

PETITPIERRE,E.:

1988. A new contribution to the cytzogenetics and cytotaxonomy of the Chrysomelinae (Coleoptera,Chrysomelidae). *Cytobios* **54**:153-159.

STEINHAUSEN,W.:

1985. Die Bedeutung larvenmorphologischer Studien für die Systematik der Blattkäfer (Coleoptera:Chrysomelidae). *Mitt.dtsch.Ges.allg.angew.Ent.*4:204-207.

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NOTES ON TWO MADEIRA PLANTS

By N. C. H. Krauss [1]

The composite plant «Abundância» (*Eupatorium adenophorum* Spreng.) has been known in Madeira for many years. On July 24, 1962 I collected a second species of *Eupatorium*, *E. riparium* Schultz-Bip., confirmed by the Royal Botanic Garden, Kew, England. This was growing in association with *E. adenophorum* in a damp area along a path near Monte. Both these species of *Eupatorium* are native to Mexico. I have seen *E. riparium* growing along a small stream in a ravine at the Desierto de los Leones, Distrito Federal, in the hills above Mexico City. Both species are pests in grazing land in Hawaii.

On November 7, 1960 I collected specimens of *Ulex minor* Roth (determined by Royal Botanic Garden, Kew) in the grassy hills above Ribeiro Frio. Since then I have seen it also at Encumeada and Santo da Serra. *Ulex europaeus* L. has been known in Madeira for a long time, but I have not seen any records of *U. minor*.

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1) Entomologist, Hawaii State Department of Agriculture, Honolulu 14, Hawaii, U. S. A.